4. The method of claim 3 wherein said computing process calculates a convex hull shape at discrete intervals in time corresponding to various stages of the heart cycle, generating several hull shapes.

5. The method of claim 3 wherein said collection of several hull shapes are sequentially compared to develop a measurement of cardiac wall position.

6. The method of claim 4 wherein said collection of several hull shapes are sequentially compared to develop a measurement of cardiac wall velocity.

7. The method of claim 4 wherein said collection of several hull shapes are sequentially compared to develop a measurement of cardiac wall acceleration.

REMARKS

Pending Claims:

In this application, claims one through seven are currently pending. This amendment further defines the "convex hull process" within the claims.**Rejection under 35 U.S.C. §102 (Belohavek Patent)**

Applicant generally agrees with the examiner regarding the content and teaching of the Belohavek reference. However the Belohavek paten does not practice the convex hull process now explicitly set forth in the claim. For example The selecting step where the most exterior companion or neighboring points are selected is not present in Belohavek.

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Rejection under 35 U.S.C. §102 (Sheehan Patent)

The applicant is in general agreement regarding the overall teaching of Sheehan however the right hand rule algorithm described in column 10 and 11 treats all data points in the raw data set the same. There is no preference for the exterior r points as explicitly required in applicants claims. For this reason the Sheehan reference is not anticipatory.

Rejection of Claim 7 under 35 U.S.C. §102 and 103 (Sheehan Patent)

The calculation of wall acceleration from images is prior art and there is no dispute about that. However the notion of computing an image which treats some data points preferentially like a convex hull is not present in the Sheehan reference. Applicant submits that the choice of parsing the data sets into time sliced sets and then using convex hull is not obvious in view of Sheehan.

CONCLUSION

Although these amendments are presented after final applicant believes that they fairly address the rejections and comments of the Examiner and entry is requested.

The claims in this application should now be seen to be in condition for allowance. The prompt issuance of a notice to that effect is solicited.

Respectfully Submitted,
ENDOCARDIAL SOLUTIONS, INC.
By its attorneys:

Date: 12/14/01

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Claims as filed compared using Word to the claims as amended.

1.- A method of modeling a chamber of the heart~~in three-dimensions~~ comprising:
collecting a set of points inside the heart, each point having coordinates in ~~three-dimensional space, forming a raw data set;~~space;
~~defining an interior direction and exterior direction for said raw data set;~~
~~selecting a first point;~~
~~selecting at least two neighbor points from said data set that are close and more exterior than said first point, said first point and said two neighbor points forming selected data;~~
~~forming a polygon with said selected data;~~
~~repeating said selecting steps and said forming steps forming a~~ computing the convex hull shape ~~thus estimating~~which estimates the boundary of the heart from ~~said raw data set.~~the set of points.

2.- A method of modeling a chamber of the heart~~in three-dimensions~~ comprising:
collecting a set of points inside the heart, each point having coordinates in ~~three dimensional~~ space;
~~defining an interior direction and exterior direction for said raw data set;~~
~~selecting a first point;~~
~~selecting at least two neighbor points from said data set that are close and more exterior than said first point, said first point and said two neighbor points forming selected data;~~
~~forming a polygon with said selected data;~~
~~repeating said selecting steps and said forming steps forming a computed~~ computing the convex hull shape ~~from said raw data set;~~which estimates the boundary of the heart from the set of points:
resampling ~~said~~the computed~~convex~~ hull shape on a regular grid to generate an enlarged set of ~~points;~~points
smoothing said convex hull shape forming a mathematically differentiable shape approximating the physiologic shape of the heart chamber from said enlarged set of points.
~~smoothing said convex hull shape forming a mathematically differentiable shape approximating the physiologic shape of the heart chamber from said enlarged set of points.~~

3.- The method of claim 2 wherein said collection process collects points at a set of times synchronized with the cardiac rhythm cycle, such that said points have physical coordinates in space at a specific time in the cardiac cycle.

4. The method of claim 3 wherein said computing process calculates a convex hull shape at discrete intervals in time corresponding to various stages of the heart cycle, generating several hull shapes.

5. The method of claim 3 wherein said collection of several hull shapes are sequentially compared to develop a measurement of cardiac wall position.

6. The method of claim 4 wherein said collection of several hull shapes are sequentially compared to develop a measurement of cardiac wall velocity.

7. The method of claim 4 wherein said collection of several hull shapes are sequentially compared to develop a measurement of cardiac wall acceleration.

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